

Yield, Biochemical Responses and Evaluation of Drought Tolerance of Two Barley Accessions 'Ardhaoui' under Deficit Drip Irrigation Using Saline Water in Southern Tunisia

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Abstract : In southern Tunisia, two local barley accessions CV. Ardhaoui; 'Bengardeni' and 'Karkeni' were cultivated in the field under deficit drip irrigation with saline water. Three treatments were used: control or full irrigation T0 (100%ETc) and stressed T1 (75%ETc), T2 (50%ETc). Proline and soluble sugars contents increase significantly under drought between accessions compared to control and varies between growth stages. Moreover, the increasing of Ca²⁺ concentration enhances the absorption of Na⁺ ion, consequently K⁺/Na⁺ decrease significantly between accessions, these results suggest that a high tolerance of Bengardeni accession to drought stress. Therefore, drought tolerance indices (STI, SSI, MP, GMP, YSI and TOL) were used to identify high yielding and drought tolerant between accessions. MP explained the variation of GYi. GMP and STI explained the variation of GYs. The high values of MP, STI and GMP were associated with higher yielding accession. Higher TOL value is associated with significant grain yield reduction in stressed environment suggesting higher stress responses of accessions. Significant positive correlations between MP, STI and GMP and negative between YSI and SSI. MP, STI, GMP and YSI, TOL, SSI are not correlated with each other.

Keywords : drought, proline, soluble sugars, minerals, yield, drought tolerance indices, barley

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